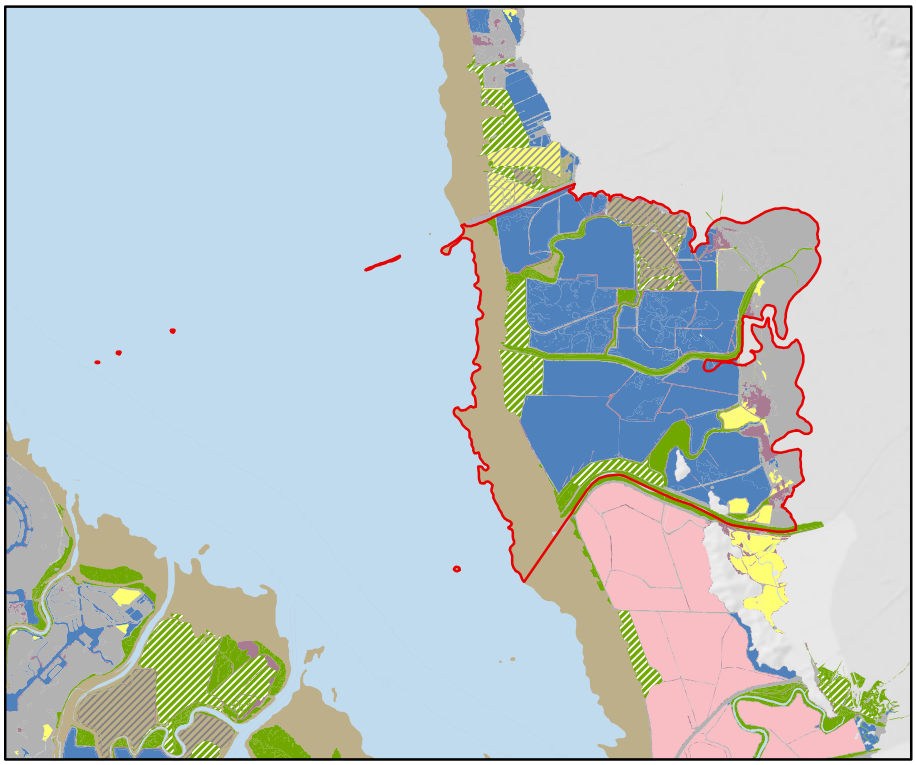

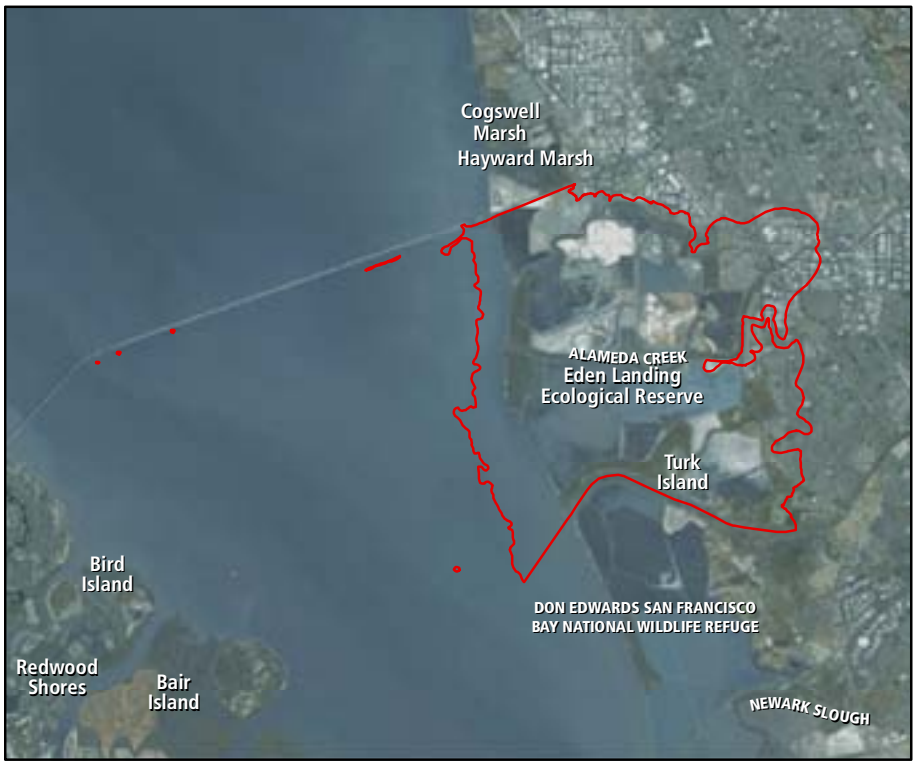

BAUMBERG AREA

East Bay between Alameda Creek Flood Control Channel and Highway 92

Baylands 2009

- Bay/Channel
- Diked Wetland
- Salt Pond
- Managed Pond
- Tidal Flat
- Tidal Marsh
- Agriculture and Other Undeveloped Areas
- Developed Areas

Red line shows the boundaries of Segment S.

Hatching indicates areas where restoration activities had occurred as of 2009. For managed ponds this included habitat enhancement.

By: San Francisco Estuary Institute

Data: Wetland data from SFEI includes BAARI (v1, 2009) Baylands and Wetlands, NLCD 2006, and wetland tracker data.

Imagery: ESRI World Imagery (updated 2015)

0 2
Miles

N

Unique Opportunities

Tidal marsh in Segment S could be restored to provide a dispersal corridor for salt marsh harvest mice, Ridgway's rails, and other native marsh species where no corridor currently exists. The excavation of small, shallow depressions to restore backshore pan habitat was included within the muted tidal eastern portion of Mount Eden Creek as part of tidal restoration plans for the original Eden Landing Ecological Reserve (ELER) Baumberg Tract. Pond complexes could be further reconfigured, modified, and managed to provide foraging and roosting habitat for resident and migratory shorebirds and waterfowl. Finally, the southern extent of the segment provides opportunities for projects to reconnect anadromous fish runs in the Alameda Creek Flood Control Channel to nursery tidal areas. Freshwater outflow (including treated water from the Union Sanitary District and East Bay Dischargers Authority) may be discharged locally for the restoration of more brackish tidal marsh. Large areas of restorable managed ponds between the bay and the developed environment provide an opportunity for innovative flood-risk-management techniques that use the storage capacity and wave-damping effects of marshes to assist in tidal flood protection.

Segment Features and Setting

Most of this segment was historically tidal marsh. These tidal marshes were very broad, with well-developed channels and abundant and large tidal marsh pans, including some backmarsh pans in the ELER Baumberg area. Outboard of the tidal marsh were large areas of tidal flat. At the upland boundary of the marshes were grasslands, of which a limited area was moist grassland capable of supporting seasonal ponding. The majority of this habitat was associated with the backshore pans near Eden Landing. Alameda Creek, a major tributary to South Bay, entered the bay in this segment. Due to its size, the creek provided a significant zone of brackish tidal marsh, a well-developed riparian habitat, and a run of steelhead. Turk Island, a northern extension of Coyote Hills, is in the southern portion of the segment.

Almost all of the tidal marsh has been converted to managed ponds. Currently they mainly remain managed, with a number of them recently restored to tidal action. (These include the Baumberg Tract, Mount Eden Creek, and North Creek Marshes; and areas E8A, E9, and E8X as part of the South Bay Salt Pond Restoration Project.) The largest extant tidal marsh is Whale's Tail Marsh, which was diked for salt production but abandoned in the 1920s. The other tidal marsh in the segment is just north of the Alameda Creek Flood Control Channel. This area was a managed pond restored with dredged material from the construction of the channel. Inadvertently, the restoration created a tidal marsh–upland transition zone by placing fill material above the intertidal zone on the eastern end of the site. Diked marshes in this area (including the Munster Tract, part of the refuge) and other duck hunting clubs exist here east of the Eden Landing Ecological Reserve.

Most of the snowy plover nesting in the South Bay subregion occurs in this segment, north of Old Alameda Creek, with limited nesting also in segment T to the north, segment P to the south, and segment N across the bay. The managed ponds in this area are important foraging and roosting habitat for migratory shorebirds and some waterfowl that use the nearby tidal flats. Some islands and levees in managed

Near the mouth of Mt. Eden Creek

ponds also provide nesting habitat for small numbers of American avocets, black-necked stilts, and Forster's terns.

Implications of Drivers of Change

Managed ponds in this segment will become increasingly difficult to maintain and operate at their specified elevations and salinities. As sea levels rise, levees protecting the ponds will need to be maintained and raised; tide gates will have to be modified, and gravity-driven systems supplemented by pumping. The outboard levees in particular will be subject to greater wave action as water depths increase, allowing larger waves to propagate inshore. Increasing wave action will also accelerate the erosion of marsh edges (including coarse beaches), resulting in a narrowing of marshes. Sedimentation rates on existing and restored tidal wetlands are expected to slow over time as suspended-sediment concentrations in the bay decrease.

Considerations for Implementing the Actions

NEAR TERM (NOW TO MIDCENTURY, PRIOR TO SLR CURVE ACCELERATION)

The near term offers significant opportunities to restore tidal marsh in managed ponds in the Eden Landing Ecological Reserve that will help create a continuous corridor of tidal marsh along the shore between Old Alameda Creek and the Alameda Creek Flood Control Channel, as well as inland to the urban edge. The following areas have been deemed suitable for tidal restoration in conjunction with appropriate flood-risk-reduction measures: all former salt ponds between the creek and channel, as well as some of the diked wetlands and detention areas used by the Alameda County Flood Control District. Tidal restoration actions could include the reconnection of complex channel networks while incorporating topographic variation by placing material to mimic features such as natural levees and high-ground transition zones, and could incorporate shallow pans. Preliminary planning for flood-risk management involves building up the existing berm at the edge of the bay and using restored marshes to damp the incoming tides.

To accelerate the accretion of the marsh surface in the moderately subsided ponds, dredge sediment could be placed either directly within the ponds or on adjacent mudflats to be redistributed by wave and tidal action into the ponds. Slopes to create elevation gradients along the transition zone between tidal marsh and adjacent upland areas could be created within existing ponds (prior to restoration) or adjacent to existing high ground and levees to provide buffers and high-tide refugia as well as habitat in its own right. In addition, salinity gradients could be re-created by seeping treated wastewater effluent from the Union Sanitary District site through created transition zones in order to incorporate brackish tidal marsh. Old Alameda Creek and the Alameda Creek Flood Control Channel could be connected to the adjacent marshes by levee breaches or water-control structures that accommodate fish passage, creating fish nursery grounds and allowing water, plant propagules, and sediment to enter the marshes from the creek.

While rates of sea-level rise are low, the water level and salinity of some of the managed ponds could continue to be managed to provide habitat for shorebirds and

waterfowl. The SBSPRP planning process has identified a portion of the ponds north of Old Alameda Creek as suitable for this type of management. The ponds would require continued protection of the outboard levee to ensure its integrity. This may be an opportunity to create coarse sediment beaches, berms, and estuarine–terrestrial transition zones at the bay's edge to reduce erosion of the levee and re-create historical habitat that has been missing from the bay. Such a coarse beach could also be continued south along the marsh scarp or any flood-control features constructed on the bay's edge.

LONG TERM (LATTER HALF OF THE CENTURY, AFTER SLR CURVE ACCELERATION)

In the longer term, if the sea-level rise accelerates and sediment supply falls as projected, marsh plains will probably give way to narrower fringing marshes. Tidal marshes may be unable to keep up with the rising sea level, resulting in increased inundation of the marsh surface. This may lead to habitat conversion, perhaps to low marsh and mudflat, and may accelerate the need for imported material. In addition, inland migration of the marsh is expected, and a gently sloping transition zone would facilitate such a migration. At the same time the coarse beach would be expected to roll landward as sea levels rise.

At some point the degree of sea-level rise may make it unrealistic to maintain the managed ponds. Prior to that point, a plan for restoring or relocating the functions of these ponds should be implemented that would move them outside the hazard zone. Simply restoring tidal action to the managed ponds late in the century may result in the creation of deep tidal ponds. To alleviate this, "warping up" the ponds could be undertaken during the earlier part of the century, allowing the accretion of the pond to be managed as well.

Recommended Actions

FOR HABITATS AND THE LANDSCAPE IN GENERAL

- Restore large areas of managed ponds to tidal marsh connected to the Alameda Creek Flood Control Channel, Old Alameda Creek, and Mount Eden Creek.
- Maintain and manage a small complex of managed ponds for shorebirds and waterfowl. Modify pond management as necessary to accommodate sea-level rise and other changes by modifying water-control structures, managing ponds to facilitate warping, and reconfiguring or relocating ponds as necessary.
- Restore natural (e.g., Turk Island) and created marsh–upland transition zones. Fill ponds at the landward edge prior to tidal restoration to create a transition zone.
- Restore willow groves, seasonal wetlands, and natural salt pans where possible.
- Restore and enhance oyster beds and eelgrass beds at appropriate locations.
- Connect waste- and stormwater to bayland habitats where appropriate to enhance the transition zone slope and reestablish a salinity gradient within marshes.
- Reduce the horizontal erosion of marshes by creating coarse beaches in front of marsh scarps; these would roll landward with sea-level rise. Fortify the bay edge to ameliorate marsh erosion and facilitate restoration.

FOR PARTICULAR WILDLIFE POPULATIONS

- Protect existing muted tidal wetland for the salt marsh harvest mouse as insurance against fully tidal wetland being lost as a result of sea-level rise.
- Target the management of ponds for nesting snowy plovers and foraging small and medium-size shorebirds.
- Control invasive *Spartina* before restoring large diked areas to tidal marsh.

Restoration Benefits

Restoring tidal marsh and the associated tidal marsh and backshore pans as well as coarse barrier beaches could benefit sensitive plant species and provide refugia for tidal marsh species and shorebirds. Managing a system of seasonal ponds (dry in summer) would provide nesting habitat for snowy plovers and other resident shorebirds. Ponds managed with year-round open water and exposed berms and islands would provide nesting, foraging, and roosting habitat for terns; they also would provide waterfowl habitat at the correct depth and salinity. Connecting the Alameda Creek Flood Control Channel to restored tidal marshes would enhance in-channel efforts for fisheries.

Challenges

Challenges in this segment include invasive *Spartina*, flood-protection considerations, the East Bay Dischargers Authority wastewater pipeline, PG&E transmission lines and other utility corridors, major predator access corridors, the potential for oyster drills to limit oyster restoration, the operation and maintenance of managed ponds in absence of salt production, and public access and recreation. The South Bay Salt Pond Restoration Project is one of the key regional plans for this segment. Planning will require coordination with local agencies and organizations, including the California Department of Fish and Wildlife, Alameda County, the Union Sanitary District, Caltrans, the East Bay Regional Park District, and the cities of Hayward, Union City, and Fremont.